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CITATION:

Kubota, Shin ...[et al]. The First Record of a Hydroid Endosymbiotic with an Ascidian in the Western Pacific. Proceedings of the Japanese Society of Systematic Zoology 1988, 38: 1-5

ISSUE DATE:

1988-12-25

URL:

http://hdl.handle.net/2433/204538

Proc. Japn. Soc. syst. Zool., No. 38: 1–5. December 25, 1988.

The First Record of a Hydroid Endosymbiotic with an Ascidian in the Western Pacific

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Synopsis

KUBOTA, S. and YAMADA, M. 1988——The first record of a hydroid endosymbiotic with an ascidian in the western Pacific. *Proc. Japn. Soc. syst. Zool., Tokyo*, No. 38: 1–5.

A hydroid attaching to the inner surface of branchial siphon of an ascidian *Cnemidocarpa areolata* (HELLER) collected from the sea off the Oki Islands, Shimane Prefecture, Japan, was described and illustrated. This endosymbiotic hydroid is tentatively dealt with *Ascidioclava* sp., since the medusan generation is unknown. The present hydroid of this mode of life is found for the first time in the western Pacific.

The hydroids living in the branchial cavity of ascidians have so far been scarcely reported. Up to the present, such an endosymbiotic hydroid was collected in the northeastern Pacific, the Coral Sea and the Tasman Sea. *Endocrypta huntsmani* (FRASER, 1911) was associated with seven species of ascidians from Vancouver Island and its vicinities (FRASER, 1911, 1912, 1914, 1937, 1946; REES, 1980) and *Ascidioclava parasitica* KIRK, 1915 was found within two species of ascidians from Wellington Harbor, New Zealand and the Great Barrier Reef, Australia (KIRK, 1915; BALE, 1924; BRIGGS and GARDNER, 1931). The generic status of *E. huntsmani* was transferred to *Bythotiara* after the mature medusa was connected with its hydroid by laboratory culture (BRINCKMANN-VOSS, 1979; cf. REES, 1980), while no taxonomic information on the medusan generation of *A. parasitica* has been available. Some authors formerly considered that *Ascidioclava* is synonymous with *Endocrypta* (BOUILLON, 1985), but *parasitica* and *huntsmani* are different species (BRIGGS and GARDNER, 1931; PENNYCULK, 1959). However, some authors considered that *A. parasitica* KIRK and *E. huntsmani* (FRASER) are the same species (TREBILCOCK, 1928; FRASER, 1946; PICARD, 1955). The present authors consider that the taxonomic position of *A. parasitica* is unsettled, because its mature medusa is unknown. Therefore, in the present paper the original scientific name is used. The occurrence of *A. parasitica* in the Great Barrier Reef (BRIGGS and GARDNER, 1931) is noteworthy, since it is distributed in the shallow bottom (37–46 m deep) of the tropical sea.

Recently an endosymbiotic hydroid with an ascidian was discovered by Dr. T. NISHIKAWA, and he kindly sent the specimens to us. This hydroid was attached to the inner surface of the branchial siphon of an ascidian dredged at 30–55 m deep off Dôgo Is., the Oki Islands in the Japan Sea on September 9–12, 1985 (see NISHIKAWA, 1986, Stns. 1, 2, 3, 5). The present hydroid resembles *Bythotiara huntsmani* (FRASER, 1911) and *Ascidioclava parasitica* KIRK, 1915 mentioned above, and this is the first occurrence of this type of the hydroid in the western Pacific.

Ascidioclava sp.

(Fig. 1, A-C)

Description. Many zooids associated with four host specimens of *Cnemidocarpa areolata* (HELLER) were examined. They were preserved in 70% ethanol and relatively contracted. The height of zooid was up to 2.5 mm. A zooid possessed of up to 20 tentacles, though their arrangement on the hydranth was uncertain due to the contraction. The hydranth is orange in color (a part dotted in Fig. 1), and the hydrocaulus, which is unbranched, is transparent. A sheet of the hydrorhiza is modified according to the shape of the host tissue. No distinct periderm is present. The hydroids bore medusa buds in four host specimens examined. The medusa buds were produced near the base of hydranth in clusters. The number of clusters was up to two, each consisting of up to six medusa buds of different grows. Up to nine medusa buds were found per zooid.

Remarks. The medusa of the present hydroid, particularly of mature medusa, is unknown. Therefore, the present hydroid is tentatively dealt with *Ascidioclava* sp. There is a possibility that it liberates the medusa of *Bythotiara* as is the case of the formerly known hydroid species *Endocrypta huntsmani*. But, for the present hydroid, according to the classification system of hydroids, use of the generic name *Ascidioclava* seems better than that of *Bythotiara*.

Host species and association rate. Host is *Cnemidocarpa areolata* (HELLER). This is a new ascidian host. The association rate of the hydroid with the ascidian host at four stations off Dôgo Island, Oki Islands was informed by Dr. NISHIKAWA (cf. NISHIKAWA, 1986). According to him, among 41 host specimens examined, the rate was 41% (Table 1). Formerly known ascidian hosts of the endosymbiotic hydroids are the species of such six genera as *Ascidia*, *Boltenia*, *Ciona*, *Corella*, *Halocynthia*, and of *Polycarpa*.

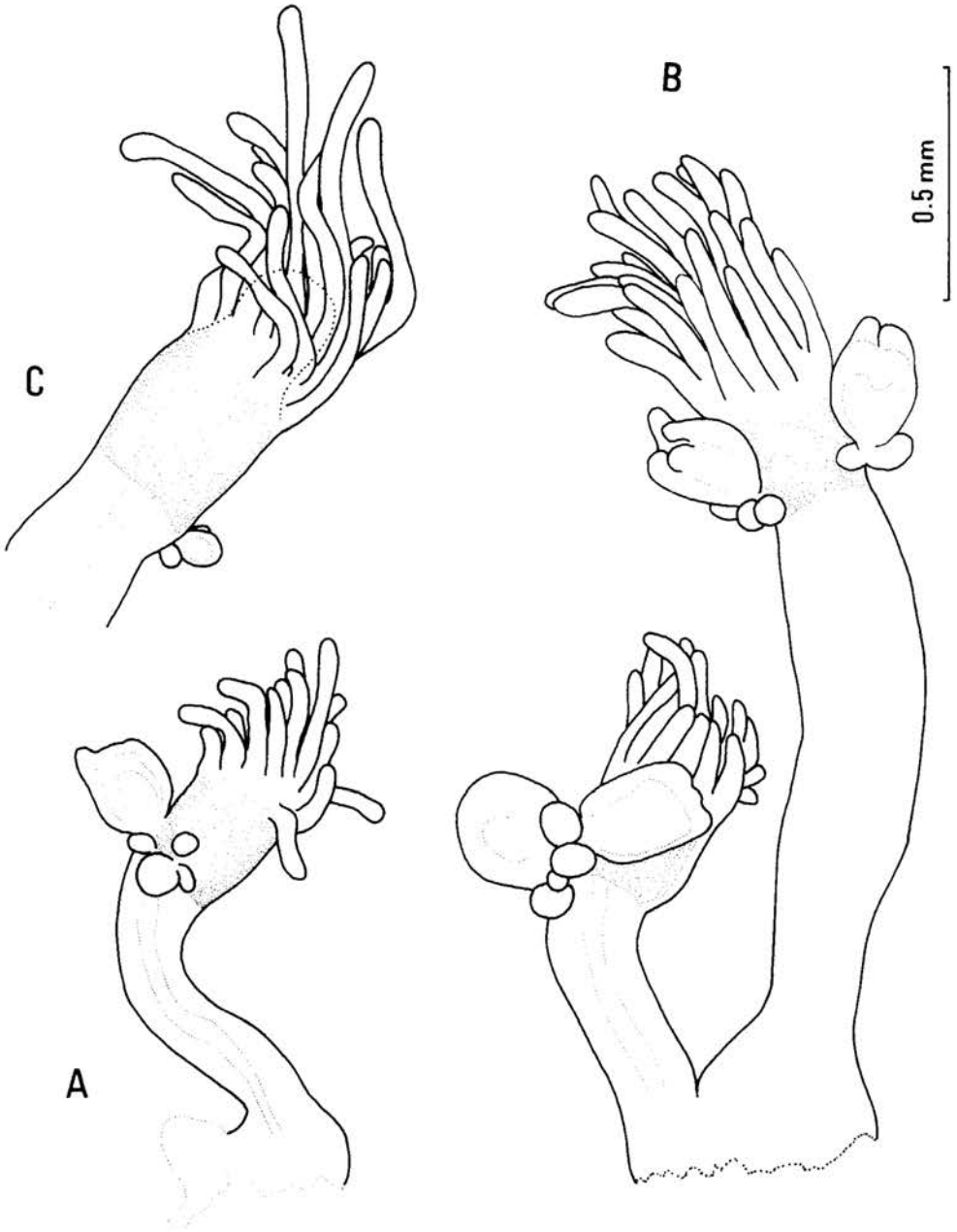

Fig. 1. Morphology of *Ascidioclava* sp. from the sea off the Oki Islands, the Japan Sea. All the zooids illustrated were picked up from one host specimen collected off Tsuma to Uzuhana Point, Oki Islands. A: A zooid with five medusa buds. B: Two colonial zooids with medusa buds. The larger one bore nine medusa buds. C: Hydranth of a zooid with three medusa buds.

Table 1. Association rate of *Ascidioclava* sp. within *Cnemidocarpa areolata* at four stations off Dôgo Is., Oki Islands.

Station	Depth (m)	No. of host specimens examined	Association rate (%)
36°10.17′N and 133°13′E	47–55	10	20
36°10.20′N and 133°14–15′E	40–55	21	48
36°09′N and 133°16′E	30–45	3	33
36°10.29′N and 133°13.52′E	35–45	7	57

Distribution. Off the Oki Islands, the Japan Sea.

Taxonomic relationship. The present hydroid might be one of the members of the family Calycopsidae as is the same case in *Bythotiara huntsmani* (FRASER) (cf. BRINCKMANN-VOSS, 1979). Before this treatment by her, FRASER (1946) included *B. huntsmani* (FRASER) in the family Clavidae based on the morphology of the hydroid. TREBILCOCK (1928) and BRIGGS and GARDNER (1931) also placed *A. parasitica* KIRK in the family Clavidae. The systematic position of these three endosymbiotic hydroids and their taxonomic relationship could be discussed when the mature medusa of the present hydroid and *A. parasitica* is revealed.

Acknowledgements

The authors wish to express their cordial thanks to Dr. Teruaki NISHIKAWA, Nagoya University, for his courtesy to introduce the present specimen to them and show them the association rate of the hydroid within the host ascidian.

摘　　要

久保田信（北海道大学理学部）・山田真弓（北海道大学 理学部・東京理科大学 長万部校舎）——ホヤ類に内部共生するヒドロポリプの西太平洋からの初記録.

島根県隠岐諸島沖産ホヤ類の1種，シロボヤモドキ *Cnemidocarpa areolata* (HELLER) の入水管内表面に付着するヒドロポリプを記載し，図示した．この内部共生のヒドロポリプは，クラゲの世代が判明しておらず，暫定的に *Ascidioclava* sp.（和名：　ホヤノヤドリヒドラ）として取り扱った．このような生活様式のヒドロポリプは，西太平洋からは初めての記録である.

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